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09/802,693	03/08/2001	Takashi Hiroi	16869P017810	8024
20350	7590	04/19/2004	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			WERNER, BRIAN P	
			ART UNIT	PAPER NUMBER
			2621	

DATE MAILED: 04/19/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/802,693

Applicant(s)

HIROI ET AL.

Examiner

Brian P. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 34-55, 66-69 and 83-87 is/are pending in the application.
- 4a) Of the above claim(s) 37, 38, 47, 50, 54, 55 and 66-69 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 34-36, 39-46, 48, 49, 51-53 and 83-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment and arguments received on January 29, 2004 have been entered. Claims 34-36, 39-46, 48, 49, 51-53 and 83-87 are examined herein; claims 37, 38, 47, 50, 54, 55 and 66-69 being withdrawn from consideration based upon the applicant's previous election. The previously advanced objections to the specification and claim 36 are withdrawn.

### ***Response to Arguments***

2. Applicant's arguments at response page 10 and with respect to the Young et al. reference (US 4,870,357 A) have been fully considered and are persuasive. The 102 rejection of claim 34 has been withdrawn because Young does not anticipate graphically displaying a relation between defect density and threshold, and changing that display as now required.

3. Applicant's arguments at response page 11, and with respect to the Schemmel reference (US 6,504,948 B1) have been fully considered and are persuasive. The 102 rejections of claims 34 and 35 are withdrawn because Schemmel does not anticipate graphically displaying a relation between defect density and threshold, and changing that display as now required.

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4. Applicant's arguments at response page 12, and with respect to the Noguchi et al. reference (US 6,411,377) have been fully considered and are persuasive. The 102 rejection of claims 34 and 35 are withdrawn because Noguchi does not anticipate graphically displaying a relation between defect density and threshold, and changing that display as now required.

5. Applicant's arguments on response page 11 and relating to the Schemmel reference (US 6,504,948 B1) as applied to independent claim 39 have been fully considered but they are not persuasive.

Summary of Argument: "Schemmel et al. does not teach or suggest that the two-dimensional defect candidate distribution displayed on the first screen changes by changing the standard."

Examiner's Response: Disagreed. Schemmel displays a two-dimensional defect candidate distribution "on a display unit 26 as a list or as a graphical representation" at column 12, line 4. The display flags individual areas of the wafer as defective as depicted in figure 2D for example (i.e., numeral 44 is a bad chip, and numeral 46 is a good chip). The good and bad chips are determined using a standard, or threshold as depicted in figure 4, numeral 80 (i.e., "TRIP = 9"). Now, if it is determined that a large number of false defects have been reported (i.e., "there are a large number of defects may be reported because they are known to have a darker background" at Schemmel column 10, line 27), the trip point (threshold) may be changed "manually or automatically" at column 10, line 24, "thereby changing silicon chips 38 incorrectly

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reported as bad silicon chips 44 to good silicon chips 46" at column 10, line 31. Given that the good and bad chips are graphically displayed as depicted in figure 2D, and given that the bad chips are changed to good chips, then the display is necessarily changed as well because that's how the defects are reported to the operator.

Schemmel still meets the requirements of independent claim 39.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

### **PREVIOUS GROUNDS OF REJECTION – MODIFIED**

7. Claim 39-46, 48, 49, 51-53 and 85-87 are rejected under 35 U.S.C. 102(e) as being anticipated by Schemmel et al. (US 6,504,948 B1).

Regarding claims 39, 40 and 41, Schemmel discloses a method comprising:

displaying a two-dimensional defect candidate distribution ("displayed on a display unit 26 as a list or as a graphical representation" at column 12, line 4) for a standard (figure 4, numeral 80; i.e., "TRIP = 9") on a first screen ("display unit" at

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column 12, line 4), said two-dimensional distribution comprising an indication of a candidate defect ("flags" at column 7, line 11; graphical representation" at column 12, line 4); and

displaying on a second screen ("second display unit 36" at column 4, line 42) an expanded view of the defect candidate ("high resolution" at column 4, line 38), responsive to a selection on the indication on the first screen ("touching the screen" at column 4, line 23); and

where the 2D defect candidate distribution displayed on the first screen changes by changing the standard (the defect candidate image indications on the defect distribution screen change responsive to a standard changes; that is, "trip point 80 can be changed manually or automatically" at column 10, line 24, "thereby changing silicon chips 38 incorrectly reported as bad silicon chips 44 to good silicon chips 46" at column 10, line 31).

Regarding claims 40 and 41, the defect image displayed in the second display is an expanded, high resolution image of the candidate defect image (i.e., scanned again by the high resolution optics responsive to a user selection; i.e., "immediate manual inspection" at column 4, line 39; "visual inspection" at column 12, line 14).

Regarding claims 42 and 43, a threshold screen is provided (figure 4, numeral 80) which also depicts defect density (i.e., the histogram depicts the density of the defects which exceed the threshold).

Regarding claim 44, the displayed defects (i.e., the "flags" at column 7, line 11 and graphical representation" at column 12, line 4) are responsive to a user selected

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threshold ("trip point 80 can be changed manually or automatically" at column 10, line 24).

Regarding claims 45 and 46, defects are displayed by type using different symbols ("displayed as boxes, which may be in colors, representing the different results" at column 12, line 9; two boxes, each a different color indicating a different result, are different symbols; Note: The claim does not specify how they are different).

Regarding claim 48, symbols are displayed (i.e., the "flags" at column 7, line 11 and graphical representation" at column 12, line 4).

Regarding claim 49, given that the symbols are displayed on a monitor, then the symbols naturally have a gray scale value. Alternately, the histogram at figure 4 graphically displays defects according to gray scale value.

Regarding claims 51 and 52, the result can be enhanced by color ("colors, representing the different results" at column 12, line 9).

Regarding claim 53, black and white displayed results are anticipated by the reference, given that the display using "color" is an alternate embodiment.

Claims 85-87 are entirely intended use or purpose claims that do not positively require anything. For example, claim 83 requires "the graphical display ... is used to judge an effect of said changes to said second standard." This is recited as an intended use of the graphical display, not an actual use that is required by the claim. Thus, these claims are not given weight as positively recited limitations, and therefore are not required of the prior art.

NEW GROUNDS OF REJECTION – NECESSITATED BY AMENDMENT

8. Claim 34, 35, 83, 84 are rejected under 35 U.S.C. 102(b) as being anticipated by Lam (US 5,043,663 A).

Regarding claim 34, Lam discloses:

displaying a first standard on a display (figure 4A, "Threshold: 600"), the first standard used to select defect candidate indications to be shown on a candidate distribution screen (figure 4A, numerals 50 are candidate defect indications that exceed the threshold; they are candidate defects because some will be filter out as "false ... indications" at column 7, line 61);

graphically displaying a relation between defect density and threshold in which the first standard is indicated (figure 4A, numeral 52; all of the defects, or peaks in the defect signal are depicted over the length of segment inspection; thus, given that all of the defects for a particular length of inspected segment are depicted, defect density is necessarily depicted; further, the threshold is depicted at numeral 54 as it appears in relation to the defect signal);

changing the first standard to a second standard ("threshold line 54 ... may be altered according to the particular needs of the user" at column 7, line 63; it can be seen that the threshold changes from 600 to 500 between figures 4A and 4B); and

changing the graphical display in response to the change to the second standard (looking at figure 4B, the threshold line at numeral 54 has been lowered to 500).

Regarding claim 35, a selected indication is selected for viewing an inspection image ("mode selected for the particular display" at column 8, line 5; for example, the



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long, short or angular defects in figure 4a can be selected for prominent display as seen in figures 4b-4d as described at column 8, lines 5-30).

Claims 83 and 84, while reciting pure intended use limitations and not required of the prior art, are nevertheless met by Lam as the entire purposes of changing the thresholds is to ensure that false defect indications are excluded from the analysis, and thus to ensure that the threshold is proper.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Noguchi et al. (US 6,411,377 B1) and Lam (US 5,043,663 A).

Regarding claim 34, Noguchi discloses a method comprising:

displaying a first standard on a display ("m1" at figure 42, step S44; the various displays are depicted in figures 43-45), the first standard used to select defect candidate image indications to be shown on a defect candidate distribution screen on the display (as depicted in figures 43-45); and

changing the first standard to a second standard (figure 42, numeral S50), where the defect candidate image indications on the defect distribution screen change

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responsive to the second standard (any change to the threshold will change the resultant defect display screens at figures 43-45).

Regarding claim 36, the first standard is calculated ("setting a threshold value" at column 35, line 38; "computed" at line 37) using an electron beam noise value ("noise generated during the detection" at column 35, line 19) for a SEM system ("SEM" at column 55, line 10; the process described in the Noguchi reference is applicable to detection by a SEM, and therefore the setting of a threshold from the detection noise is applicable to noise from the SEM detection).

Regarding both claims, Noguchi does not teach the newly added limitation of graphically displaying a relation between defect density and threshold in which the first standard is indicated and changing the graphic display in response to the change to the second standard.

This is what Lam teaches as described in the 102 rejection above.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to provide Noguchi with the graphical display of Lam, in order to allow the user to "selectively filter out false or non-defect indications" (Lam, column 7, line 61) thereby giving the user an intuitive and graphical control over the process of determining the correct threshold to be used for defect detection.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Werner whose telephone number is 703-306-3037. The examiner can normally be reached on M-F, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian Werner  
Primary Examiner  
April 16, 2004



**BRIAN WERNER**  
**PRIMARY EXAMINER**